



## MEETING SUMMARY

### CALIFORNIA WATER PLAN UPDATE 2013

#### DESAL RMS WORKSHOP

12:30 – 3:30 P.M.

815 S STREET, SACRAMENTO, CA

### Meeting Objectives

1. Review the second draft of the Desalination Resource Management Strategy (RMS)
2. Obtain feedback on suggested edits.

### Welcome, Introductions and Agenda Review

A workshop was held on November, 2012 to discuss the current draft of the Desalination (Desal) RMS. Lisa Beutler, Executive Facilitator, reviewed the agenda for the workshop and introductions were made around the room and on the phone. The co-authors for this RMS are Richard Mills and Michael Ross from DWR.

### Overview

The authors explained that this version of the Desal RMS provides some additional background which provides definitions for desal. The broad range of desal technology and different applications is described, while noting that the focus of this chapter is desal of ground or surface water to remove salts (not contaminants) to create drinking water. The RMS does not address desal for agricultural purposes. While that is how the RMS has functioned in the past, it is now made explicit.

The RMS should explain what desal is, and what desal is in regards to this chapter. It represents and interesting conversation that has evolved over time. The chapter includes concepts of ocean and brackish desal. The current document represents a rough first draft, which may include duplication in some areas. There is significant research in this area and the authors have a collection of references that are still being worked through.

### Document Walk Through

Participants extended their appreciation to the authors for sending the draft document out early for the workshop, and providing time for review. The breakout of seawater and brackish desal was well received, as was the technical background. Comments on the document section are provided below.

### General Comments

- Review the 2003 Desal Task Force report for content and potential recommendations. This can be cited to help resolve questions about using the words “should” and “could.” See [www.water.ca.gov/desalination/pud\\_pdf/Findings-Recommendations.pdf](http://www.water.ca.gov/desalination/pud_pdf/Findings-Recommendations.pdf)
- Check with California DPH regarding their desal studies.



## **Introduction**

There was discussion on the last two paragraphs found on page 1. The connections between renewable energy, energy use, energy costs and greenhouse gas (GHG) emissions are complex. The relationships to desal need to be carefully considered.

- Page 1, in the 3<sup>rd</sup> paragraph: The intent of the Renewables Portfolio Standard is to reduce existing greenhouse. It was suggested to bring the language from page 7, lines 4-10, forward into this first section. (Note: Line 4 and the phrase “is likely not sustainable” sounds like an editorial. Restate to say that many California communities are facing water supply challenges.)
- Page 1, 3<sup>rd</sup> and 4<sup>th</sup> paragraphs: The energy language is controversial and backs into an issue that should be treated more elegantly and further back on the document. This should perhaps be placed into a side bar. The two policy issues may not necessarily link together. If they do, it would be better to move these two paragraphs further back (e.g. at the bottom of page 20).
- Coupling renewable energy with existing infrastructure is what allows desal to move ahead – and the energy nexus is important. The issue revolves around energy use, energy costs and GHG emissions.

## **Desal Technology**

- Page 4, line 6 (first bullet): There was a question as to where desal is being used to remove pollutants prior to discharge. The responses noted that Orange County uses desal to treat municipal wastewater and that Palm Springs also uses desal prior to discharge.

## **Key Aspects Regarding this RMS**

- Brackish water desal is being developed in California. Seawater is facing obstacles. Although the same technology is used, the two applications have different issues. Why is it so challenging? It’s worth it in some areas, not others. (The authors noted that they will discuss existing conditions and document future directions.)
- In the issues section, call out seawater issues: intake, brine disposal. How are the issues different for inland and seaside projects? That will help clarify the distinctions.
- Page 5, line 1: Begin the first sentence by adding “For desalting purposes, the term brackish...”
- Page 5, Table 9-3: There was a discussion about setting the minimum level for brackish water at 500 mg/l TDS, with were several suggestions that the minimum level be set at 1000.
  - It was noted that water served from the Colorado River is well over 500 TDS.
  - The AWWA Dictionary of Water Terms defines brackish as "water containing 1,000 to 10,000 mg/L TDS.”
  - This table could serve as a valuable tool – it might be helpful to state that this is controversial and say “some people think X, others think Y.”
  - Are there any salinity standards established by DPH/DPS for drinking water?



## Technologies Related to Desal

- Page 6, line 24: Note that thermal desal methods are not being proposed in California.
- Page 6, lines 25-29: These industry numbers tend to be based on the desal technology and thus include desalination of seawater, brackish water, and even wastewater. Some people aren't aware of that and assume it is mostly sea-water. It is important to add some clarification when using these numbers.
- Page 6, lines 32-33: There is a statement that capital and O&M costs are declining. There is some evidence to suggest that costs are increasing due to rising energy costs, higher steel prices, etc. It might be preferable to say that costs have come down over the past twenty years but are unlikely to decline further barring major breakthroughs.
- Page 7, Table 9-5: Add electrodialysis reversal (EDR)

## Desal in California

- Page 7, line 4: This sounds like an editorial (see first bullet for introduction, above).
- Page 7, lines 17-18: The secondary drinking water standard is 1000 mg/l of TDS.

## Past

- Page 8, line 8: Clarify that the increase in installed capacity is for brackish desal. Seawater desal has not grown considerably. "Rapid rise" does not accurately reflect the past rate of installation in California.
- Page 8, line 20: Delete the first part of the sentence referencing nuclear power.

## Present

- Page 9, Table 9-6: See [www.pacinst.org/reports/desalination\\_2013/index.htm](http://www.pacinst.org/reports/desalination_2013/index.htm) for a listing of existing SW desal plants in California and their status

## Future

- Page 9, line 4: The words "are given" represent an editorial.
- Page 9, lines 4-6: This last sentence is highly speculative. Perhaps summarize the number of plants proposed in 2006 and in 2012 (for both, see Pacific Institute reports); maybe then discuss which have been built or are no longer being considered
- Page 10, figure 9-3: The graphic blends both types of desal, it would be better to have a separate graph for each type (brackish and seawater).
  - The AFY seems very low and the timeline should be reduced to within 5 or 10 years in the future so that updates can be made in 5 or 10 yrs.

## Brackish Desal

- Page 10: There was a question as to whether beach wells represented a brackish or seawater source. The response indicated that the determination would depend on whether the well represented an intake of seawater versus mining seawater intruded groundwater.



- It might be helpful to include a map and/or graph of the amount and distribution of brackish groundwater, and existing plants.

## Regulatory Framework

- Page 11, line 34: Brackish surface water sources will not necessarily be located within the 'coastal zone.'

## Basin Plans

- Page 12, lines 5-9: This text is actually part of the State Water Boards "Sources of Drinking Water Policy."
- Page 12, lines 11-13: Delete this sentence.

## Potential Benefits of Desal

- It would be helpful to have more language on reliability - this is one of the major considerations when evaluating supply portfolios.
- Page 14, lines 9-17: This paragraph is better suited to a 'definition' themed section - Please consider moving to page 3 or page 6.
- Page 14, lines 18-20: The sentence sounds speculative.
- Page 14, lines 23-25: This sentence is confusing (is there a "shown below" planned?) - consider deleting.

## Potential Costs of Desalination

- Page 16, Table 9-9: This should include monitoring and mitigation costs.
- As one moves inland, the cost increases with increased power requirements to pump the water to higher inland uses.
- Despite various technology improvements (e.g., membranes, pumps, etc.), costs have climbed significantly over the past several years -- mostly due to increased capital costs for materials and increased operational costs for energy. Current membrane technology is close to its practical maximum efficiency, so getting other than incremental improvements is likely to require significant breakthroughs in materials or techniques.

## Major Issues Facing Desalination

- Bottom of page 16 to top of page 17: Another issue for seawater desal is that of source-water quality. In some areas, urban runoff and microbial levels can be very high.
  - The issue of influent water quality should not be a major issue for desalination except for constituents that are not removed by RO.
- Obstacles to seawater desal are based on project design and location. Those facilities that successfully address relevant environmental issues have far fewer "obstacles" than those that don't.



## Funding

- Page 17, line 8: Funding has perhaps not helped make desal "the alternative of choice" - but funding can be an implementation barrier both in terms of pre-construction costs, and for full-scale development.

## Reject Water (Brine) Disposal

- Page 18: This section should include a discussion of brinelines for inland brackish groundwater desalters - the SAWPA line is a prime example of REMOVING a barrier to brackish water development.
- Page 18, line 24: The change in outfall concentrations is not an environmental benefit.
  - Perhaps add a sentence at the end that says "However, it may change the dilution ratio for the wastewater discharger, decreasing discharge limits for other constituents, such as metals."
- Site specific factors should be considered with respect to brine disposal - this is an issue currently being examined through the Ocean Plan Amendment process.
  - Note also that discharging brine to treatment plants may compromise the ability of the plant to recycle water. Again, site specific factors should be considered to determine what method of disposal is most appropriate. As such, the sentences, "Brackish water plants in California discharge their concentrate to municipal wastewater treatment systems where they are treated and blended with effluent prior to discharge. For brackish water plants, this type of discharge is likely to continue," may not be entirely accurate. (Page 18, lines 13-16.)

## Planning and Growth

- There was a discussion as to the references regarding "growth inducement."
  - Is this mentioned in the other RMSs relating to water supply? If not, why is it called out here?
  - If one were to say high cost desal water were needed to allow growth, then the new residents might be asked to pay more.
  - In some areas like Huntington Bch and Carlsbad, communities are close to built-out yet plants are planned because MET offered a rebate of \$250/acft at five plants along the coast.
  - Much of the planning and Growth section could be removed from this document because it really doesn't add much, except a diversion of the fact that desal is a costly tool for those who need water anyway.
  - Suggest the chapter refer to both the 2003 CA Desal Task Force report and the 2004 CA Coastal Commission report, "Seawater Desalination and the California Coastal Act", both of which address growth-inducement.
- There is a lack of State standards on land use.



## Climate Change

- Page 20, line 2-4: Consider deleting this section. If it is mentioned, should just be a reference to the DWR report from a couple of years ago.
- Development of local brackish water sources provides a minimal baseline supply that should help with the uncertainties that result from climate change.
- The climate change section should differentiate between GHG emissions and climate change adaptation. You cannot reduce the embedded energy in water supply (mitigation) by adding the most energy intensive alternative to your portfolio.
- Desal plants are vulnerable to flooding, especially with sea-level rise.

## Desalination Effects/Impacts

- Page 20: Add the energy discussion in at the bottom of page 20.

## Once-through Cooling

- Page 25, lines 29-39: The SWRCB Ocean Plan is developing separate requirements for desal. This section should not judge what is the best available technology here (line 38).

## Energy Use and Sources

- Page 22: Add a discussion on wave energy for desal. This
  - This is still largely at the pilot stage; there are no current proposals offshore of California and they raise their own set of environmental issues that must be addressed during review/permitting.
- The source of the power to supply the desal facility should be identified at the early planning stages.
- Perhaps reference what has been done in Australia – some of the large-scale plants there are fully powered with renewables. Discuss how that approach could (or couldn't) be done in CA.

## Recommendations

- Recommendation #4, page 25, line 1: There was a discussion as to whether or not to remove the word “only.”
- Recommendation #5, page 25, lines 7-9: The recommendation should be for a central permitting agency.
- Recommendation #6, page 25, lines 12-14: Consider rewriting last sentence.
- Recommendation #7, page 25: See earlier comment that each desal project should identify power sources early on.



## Attendance

### In person:

Dave Bolland, Association of California Water Agencies  
Rob Cozens, Resighini Rancheria EPA  
Bruce Gwynne, Department of Conservation  
Carl Lischeske, Delta Stewardship Council  
Fernando Paluch, West Basin Municipal Water District  
Suzie Rose, CPUC Division of Ratepayer Advocates  
Kim Schneider, Desal Alternatives  
Amy Vierra, Ocean Protection Council  
Evon Willhoff, Planning and Conservation League  
Betty Yee, Central Valley Water Board

Jose Alarcon, DWR  
Megan Fidell, DWR  
Kamyar Guivetchi, DWR  
Nancy King, DWR  
Hoa Ly, DWR  
Richard Mills, DWR  
Elizabeth Patterson, DWR  
Toni Pezzetti, DWR, FloodSafe  
Michael Ross, DWR

### Via webinar:

Rebecca Bjork, City of Santa Barbara  
Sean Bothwell, California Coastkeeper Alliance  
Edward Caldwell, West Basin Municipal Water District  
Seth Carr, City of Las Angeles  
Patricia Chen, Patricia Chen Law Group  
Alina Constantinesu, Larry Walker Associates  
Heather Cooley, Pacific Institute  
Emily Corwin, Contra Costa Water District  
Ronald Davis, CalDesal  
Lesley Dobalian, San Diego County Water Authority  
Taj Dufour, Soquel Creek Water District  
William Everest, Cardno TEC  
Val Frenkel, Arcadis  
Christopher Gabelich, Metropolitan Water District  
Rosann Gallien, San Diego County Water Authority  
Richard Gardner, South Coast Water District  
Joe Geever, Surfrider Foundation  
Francisco Guerrero, Sanitation Districts of Los Angeles County  
Cedric Irving, State Water Boards  
Saundra Jacobs, SFC Consultants





Russell Lefevre, IEEE  
Tom Luster, California Coastal Commission  
Tony Maggio, Flow Science  
Joe Monaco, Dudek  
Cody Naylor, Legislative Assistant, State Assembly  
Debran Jones Reed, Semptra Utilities  
John Ricker, County of Santa Cruz  
Kevan Samsam, Delta Stewardship Council  
Melanie Schumacher, Soquel Creek Water District  
Thomas Seacord, Carollo  
Paul Shoenberger, Mesa Water District  
Rachel Struglia, Dudek  
Warren Teitz, Metropolitan Water District  
Kevin Thomas, RBF Consulting  
Alicia Thompson, US Navy  
John Ugoretz, US Navy  
Peter von Langen, Central coast Regional Water Board  
Eric Wilkins, Department of Fish and Game  
Youxian Wu, San Diego State University  
Dan Young, Surfrider Foundation  
Eric Zigas, ESA Assocaites

Peter Coombe, DWR  
Jennifer Morales, DWR

Facilitation: Lisa Beutler, MWH, Executive Facilitator; Judie Talbot, CCP, Facilitation Support